Does Global Alcohol need to Worry about the Rise of Legal Cannabis?

25 February 2019

Key Takeaway
Alongside Jefferies’ cannabis initiation, we consider the impact on alcohol.

Conclusions (1) Recreational cannabis potentially 1% of global alcohol 2027 (2) Cannabis risk to alcohol concentrated in N.America (3) Greater near term risk to US beer from wines/spirts, not cannabis (4) Cannabis-infused beverages - the creation of a new industry.

Cannabis - high growth industry expected to reach $45bn by 2027
Jefferies cannabis analyst (initiation published today) expects the global legal cannabis industry to grow from $12bn (retail sales) 2018 to $45bn 2027 ($17bn medical, $28bn recreational) at 16% CAGR vs spirits 5% and staples 2-3%.

Should global alcohol worry about the growth of cannabis?
We estimate 2027 global alcohol sales $2.9trn vs recreational cannabis $28bn. If 100% of cannabis is substituted from alcohol, this represents a 1% risk globally. With majority of growth sourced from illicit consumption (Euromonitor c$140bn), the risk for alcohol to lose share of buzz to cannabis, on this basis, is negligible.

Largely a US phenomenon
With more liberal attitudes towards cannabis we estimate US account for 71% ($22bn) of the global recreational market by 2027. The shift from illicit to legal channels provides some protection, but worst case assuming 100% is substituted from alcoholic beverages this implies 6% ($22bn) retail sales at risk. External studies point to up to 15% ($58bn) decline in alcohol sales where cannabis is legalised.

But, wines and spirits the bigger near term risk for US beer?
Early studies/data points to beer being more at risk of substitution given lower prices and consumer demographics. Assuming a fair share is substituted from beer, this implies 6% ($9.6bn) of beer retail sales at risk. However, if beer continues to lose share to wine and spirits (Jeff 2017-27-280bp, 2007-17 -300bp), this is worth $10.7bn to beer retail sales. Therefore, the biggest risk to US beer remains wine and spirits in the near term.

Bull case on cannabis industry would represent a greater risk for alcohol
Canopy Growth sees a $500B+ opportunity for “global market disruption” partly targeting a global alcohol market of $1trn (Euromonitor 2017 $1.5trn). Worst case scenario, this could imply $391bn (c40%) of the beverage alcohol market at risk if disruption is pro-rated across the outlined industries, representing a greater longer term threat to alcohol.

Cannabis infused beverages - the creation of a new category
Replicating the effects of alcohol with zero calories and no hangover, we see cannabis infused beverages as a potential key recruiter into cannabis. It also provides a way to consume cannabis in a social, widely accepted, healthier way vs traditional combustion. The emergence of the cannabis-beverage category is driven by startups with the large US domestic beer co’s getting involved to offset potential share erosion in US beer whilst the international players keep a close eye but cautious approach given reputational risk.
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US Beer - in the crossfire

What is happening to the N American beer market?
The N American beer market has been in structural decline for over two decades partly driven by falling per capita consumption as consumers, especially younger generations are increasingly health aware. But the more prominent driver of the decline in the beer market has been share losses to wine and spirits, within the overall beer market it is mainly mainstream beer that has been under pressure as consumers not only shift from beer to spirits and wine but also from mainstream beer to craft and imported brands.

Per capita consumption of beer in the US peaked 2008 at 81.3l and has since fallen to 73.8l in 2017 expected to see further pressure reaching 71.6l in 2022 (Euromonitor). We believe this is partly a "normalisation" of consumption, the average US consumer still consumes higher levels of beer compared to the global average 26l (2008 28l) but also compared to the W European consumer 56l (2008 63l).

Exhibit 1 - US beer PCC 2003-22E
Source: Jefferies, Euromonitor

Exhibit 2 - US Spirits PCC 2003-22E
Source: Jefferies, Euromonitor

Exhibit 3 - US Wine PCC 2003-22E
Source: Jefferies, Euromonitor

25 years of beer losing share to spirits and wine
Over the past 10 years from 2007 to 2017, beer has lost 392bp share of supplier gross revenue to wine and spirits ($2.8bn) and 301bp share of retail sales ($6.7bn lost). DISCUS recently published data for 2018, showing further 63bp share loss for beer to 45.5% (F17 -90bp). Over the next ten years we model a continued share loss for beer to wine and spirits, albeit at a slightly more moderate pace. Recent initiatives within the hard seltzers category provides some offset against share losses to spirits, however it is unclear how sustainable this trend its.

Exhibit 4 - US Beer, Spirits and Wine share of throat
Source: Jefferies estimates, DISCUS

15 years of mainstream beer losing share to craft
In 2008 in the US, the top 5 brands accounted for 54.8% of total industry volumes (top brand 21.4% share) compared to the top 5 brands globally 12% and vs W Europe 14.1%.

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By 2017 this has seen some adjustment with the top 5 brands in the US accounting for 30.8% vs world 14.5% and W Europe 12.6% - but the market continues to be more concentrated from a brand perspective than the more fragmented international beer markets.

In 2012, craft accounted for c6.5% of US beer volumes. This peaked to around 13-14% in 2016/17 before moderating to 12.3% in the latest period (end of 2018). Growth of craft beer has seen a significant slowdown from c15% in 2014 to c5-10% 2016/17 to LSD and even decline at the end of 2018.

Exhibit 5 - Premium beer growing ahead of mainstream and economy

![Graph showing premium, mid-priced, and economy beer growth](source)

10 years of domestic beer losing share to imports
Another growing segment of the beer market has been imported brands mainly led by the popularity of the Mexican brands, but also some European brands. The strongest growing Mexican brands are Corona (27% share of the imported segment), Modelo (23%), Dos Equis (6%) and Tecate (5%). European brands have been less successful, the largest share of the imported segment held by Heineken (12%) and Stella Artois (7%).

Exhibit 7 - Imported beer growing ahead of domestic

![Graph showing imported and domestic beer growth](source)

And now add to that…Cannabis
Although initial steps are being taken towards international legalisation, cannabis is largely a North American phenomenon accounting for 98% of global recreational and 63% of medical use by 2027. Consumer spending on cannabis is not new; however legal cannabis is new. This argues for cannabis being less of a threat to other consumer categories such as beverages, given the migration from the illicit to legal channels.

Despite the large source of illicit consumer spend to go after, we do believe the normalisation and socialisation of cannabis could recruit new consumers into the industry as the stigma attached to it comes down. Distribution, innovation and new product categories are also catalysts for conversion of new consumers and we see cannabis infused beverages as a key door opener into the category.

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More of a risk to beer and wine than for spirits?
The data remains inconclusive as to whether cannabis is a complement or substitute to alcohol. However, there is certainly a risk of substitute from alcohol into cannabis. As indicated by the CBHSQ Survey, cannabis users skew to lower education, unemployed, lower-income which we believe places beer most at risk of cannabis adoption as the average price of spirits and wine are c6.5x and 3.5x that of beer.

Taking this logic one step further leaves lower-end mainstream beer most disadvantaged due to the income profile of cannabis users, where ABI and Molson Coors portfolios are highly exposed. Constellation on the other hand should be less at risk with its portfolio skewed towards high-end imports and Hispanics (40% of Constellation’s consumption).

So, who is beer’s biggest enemy?
Although the “headline risk” of cannabis is sending ripples through the US beer market, we believe that legalisation is mainly shifting illicit consumption into legal channels rather than necessarily disrupting and cannibalising beverage alcohol.

We show in this report up to $9.6bn of beer sales at risk – although this is highly dependent on regulation and removal of social stigmas. What is an equally as big issue for beer, already happening at a rapid pace, is the share loss to spirits and wine, especially amongst young consumers. The beer companies are not agnostic to the fact but pursuing various routes to fight back against spirits, both through making the beer category more attractive but also by increasing their exposure to beyond beer. ABI recently announced the acquisition of Cutwater spirits (see report) with a portfolio of spirits, mixers and RTDs.

Looking at the US market we forecast $21.7bn adult use cannabis sales by 2027. If 100% of this is substituted from alcohol this is worth c6% – assuming a fair share comes out of each of the beverage categories, this implies retail sales at risk for beer of $9.6bn.

A 15% decline in beer sales, as indicated per the external study referenced, would be worth $26bn. If we apply this impact only to the 17 states where adult-use cannabis is expected to be legalised by 2027, this implies beer retail sales at risk of $8.6bn. Risk could potentially be higher if alcohol sales decline at similar level in all 32 states with medical laws ($16bn).

Over the past 10 years from 2007 to 2017, beer has lost 392bp share of supplier gross revenue to wine and spirits ($2.8bn) and 301bp share of retail sales ($6.7bn lost). Over the next ten years we model a continued share loss for beer to wine and spirits. We model for c277bp retail share loss by 2027 worth $10.7bn of beer retail sales.
**Who’s at risk?**

The beverage companies that are most exposed to the US market are Constellation (97%) and TAP (68%), Remy 30%, Diageo 30%, Campari 26%, ABI 25%, Pernod 18% and Heineken 7%.

We believe beer, and especially mainstream beer is at the highest risk of disruption due to demographics of consumer base and affordability. This leave ABI at most risk out of our European coverage and US based Molson Coors and Constellation (less risk given Hispanic dominated consumer base and position in premium/imported segment).
What are the companies doing?

We believe that Cannabis is currently, and for the foreseeable future mainly a North American phenomenon (challenge); we do not expect adult use, recreational cannabis, to gain widespread traction outside of N.America. N.American players such as Constellation were first to move, taking a stake in Canopy Growth and Molson Coors has signed a JV with Hexo Corporation.

We believe that the international beer and spirits players are studying the space carefully, testing the waters in some cases (e.g., Heineken Lagunitas Hi-Fi Hops), and aligning allies (e.g., ABI and Tilray research agreement) for potential future advancement. The key issue, in our view, for the international players is reputational risk, with cannabis still and likely to remain for a long time, illegal in large parts of the world.

Legally alcohol companies are not allowed to produce cannabinoid infused drinks without a specific license, also cannabinoids are not approved ingredients by the TTB for inclusion in any beverage products. This implies beverage alcohol companies are forced to find partners to get involved in the market.

**Constellation brands (covered by Jefferies analyst Kevin Grundy)**

Constellation Brands (ticker STZ, covered by Kevin Grundy) has aligned with the cannabis industry more aggressively than peers, with $4B invested (~36% ownership) in Canopy (now worth ~$7.1bn) and warrants to take ownership >50%. Canopy offers the largest legal cannabis production footprint in the world, which gives STZ a strong foothold into this market.

Constellation Brands estimates the US cannabis industry is a lucrative opportunity at $50B in sales, including both legal and illegal markets (i.e., the prospective “size of the pie” assuming full legalization), which places it among a select group of large consumer packaged goods categories spirits $74bn, wine $46bn, legal cigarettes $94bn and beer $104bn (Euromonitor, 2017 RSV). The growth rate for cannabis is attractive given its nascent state of business, with industry trade groups forecasting an 18% 10-year CAGR for legal use in North America.

Canopy’s CEO Bruce Linton has indicated the company might launch cannabis infused drinks in Canada as edibles becomes fully legalized in 2H19. He suggests the potential of a Tweed and Tonic (Tweed is Canopy’s main consumer brand) that could lead the development of a cannabis long-drink category.

**Molson Coors (covered by Jefferies analyst Kevin Grundy)**

Molson Coors has signed a joint venture with HEXO Corp in Canada, announced August 2018 to focus on cannabis-infused beverages. Through the JV HEXO is planning to launch a full range of non-alcoholic cannabis infused beverages to be launched in Canada in October 2019.

Management maintains that it is still too soon to determine the long-term impacts of legal cannabis on beer, but it nonetheless expects acceptance to increase going forward and wants to be a participant in this new segment. Molson Coors has mentioned that its key criteria for a partner is for an organization that is science based, has guarantee in continuity of supplies, and an existing track record.

Molson Coors’ CEO Mark Hunter has stated the company believes beverages could take 20-30% of the total US cannabis industry creating a $20bn category.
ABI – Tilray a cautious approach

**Approach.** We believe ABI will maintain a highly cautious approach to cannabis given the reputational risk. ABI sells more Budweiser in China than in the US where cannabis is and will likely remain strictly illegal with severe punishments. Given that it is possible that growth in the legal cannabis channel could come from the illegal channel, we believe that the bigger risk for beer in the near term is loss of share of throat to wines/spirits.

**Research partnership.** ABI has signed a partnership with Tilray to research non-alcohol beverages containing THC and CBD, to get insights into both the production of cannabis infused bevs and its potential impact on beer. Whilst the partnership does not appear to provide a route to control of Tilray, it offers a lower risk approach given reputational considerations for ABI as a global brewer. The partnership is limited to Canada and decisions regarding the commercialization of the beverages will be made in the future. Canada is c.2-3% of group profits.

**Partnership not a JV / equity stake.** The research partnership is between ABI's Canadian subsidiary Labatt, and through Tilray's Canadian adult-use cannabis subsidiary High Park Company. High Park Co develops, sells, and distributes a portfolio of socially responsible cannabis brands and products in Canada.

**Low risk approach.** At this stage, the research partnership with Tilray does not appear to include an option to take majority control in the future. This low risk approach in part reflects reputational risk - ABI is a global business with a number of markets where attitudes to cannabis are less liberal than Canada and parts of the US - and with Tilray also indicating that we're not looking to get bought or acquired.”

**Investment of $100m.** Each company intends to invest up to $50 million USD, for a total of up to $100 million USD. Note that the research will focus on both THC (ingredient that gets users high) and CBD (non-intoxicating ingredient). Per Bloomberg, Tilray is confident it has solved several of the problems that have slowed development and consumer adoption of cannabis-infused beverages, including water solubility and flavor. Per CEO Brendan Kennedy "the one core focus will be creating beverages that we think will delight consumers."

**Who is Tilray (Ticker TLRY).** Market Cap $6.6bn. 2017 revenues $20.5m, adj EBITDA - $5.5m. Tilray is a global pioneer in cannabis production and distribution. 76% of the shares are owned by Privateer Holdings, Seattle based venture capital firm. See previous note.

Heineken - dipping in a toe with Lagunitas

**Approach.** We believe that Heineken currently does not view cannabis as a global discussion outside US and Canada (6% of Heineken profit). However, the company is keeping a close eye on the evolution of the N American market. The company has some experience of cannabis markets with the Netherlands, where cannabis is legal. However, we do not believe that it provides a good guideline of what could take place in N America given the lack of innovation in Europe, especially of edibles.

**Regulation will be key.** Heineken, like the other global beverage companies takes a conservative approach to the cannabis market. The lack of regulation and inconsistent level of self-regulation from incumbent edibles players poses a potential risk.

**Playing the cannabis market with Lagunitas.** Heineken, through its Lagunitas subsidiary, has created Hi-Fi Hops, a sparkling water infused with cannabis (one product has 10 mg of THC and one with 5 mg of THC and 5 mg of CBD). Lagunitas sells hop infused carbonated water to a licensed cannabis manufacturer who infuses THC, bottles and

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distributes the product under the Lagunitas brand. We believe Heineken sees Hi-Fi hops as an opportunity to learn and gain understanding of how the space develops.

**Pernod - premium spirits exposure, monitoring from the sideline**

*Approach.* The company questions whether cannabis will have an impact on premium wine and spirits. To date there is insufficient data to draw firm conclusions and early indications mainly suggest potential substitution from lower end beer and wine. Company also argues that the market for cannabis consumption already exists, just in illicit form.

**What consumption moments could be at risk?** Pernod operates its business in segments of consumption moments (not traditional category vs market matrix). A few years ago, the market worried about ecstasy taking share from spirits in the “late night energiser” segment but this has not been the case. The consumption moment where the company has seen some impact from cannabis to date is the “stay at home mum, just before the kids come back from school”.

**Cannabis not a top-worry.** The main disrupters outlined by the company is 1) Health and wellness focus especially amongst younger generations 2) Market fragmentation with smaller craft brands disrupting traditional business and brand models 3) Innovation shortening product lifecycles and 4) Digital removing barriers for route to market and marketing. 5) Cannabis no impact to premium spirits seen yet.

**Monitoring from the side-line.** Pernod has confirmed it is “seriously monitoring and analysing” the cannabis drinks market in US and Canada. To date initial evidence does not suggest any impact to premium spirits but only to lower end beer and wine. Due to reputational risk, we do not see the company getting involved at this stage - c10% of profits are generated in China.

**Diageo - no rush to get involved**

*Approach.* Diageo is monitoring the evolution of the cannabis sector to understand the long-term consumer impact. The company points to industry data (DISCUS) that suggests there is currently no negative impact to the spirits sector.

**No rush to get involved.** There have been several articles indicating Diageo is in close discussions with Canadian cannabis companies. We believe concerns around the regulatory framework and longer-term impacts on consumers will hold back the company from making any near-term decisions. Until cannabis is legal on federal level, with better visibility on regulation regarding how it is sold and marketed to consumers and what occasions and categories it is impacting, we believe that the company may find it hard to deploy cash efficiently.

**KO - conservative approach**

An article in Bloomberg BNN in September 2018 cited multiple sources saying that Coca-Cola would be in serious discussions with Aurora to develop CBD infused drinks.

Following the article, the company issued an announcement saying the company has no interest in Marijuana or Cannabis but along with many others in the beverage industry they are closely watching the growth of CBD as an ingredient in functional beverages.

Later, on 31 October, CEO James Quincy was quoted in the Wall Street Journal that the co will not use cannabis derived ingredients in the US or globally until it is legal and there is a scientific consensus that it is safe for daily consumption.

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What does cannabis mean for alcoholic beverages?

Legalisation of cannabis for recreational use, in Canada and parts of the US currently, and in the future on an international basis, we believe represents a risk to beverage alcohol. Risk of disruption comes given cannabis’ ability to replicate the effects of alcohol but with zero calories, no hangover and less driving restrictions.

To date there is only anecdotal evidence to suggest some substitution, mainly pointing to wine and beer given its relative affordability vs premium spirits; however, the dataset is not rich enough today to draw firm conclusions of either substitution or complementarity.

In this report we take at three different perspectives on potential impact:

1. **Cannabis steals share of buzz from alcohol** – we look at the projected growth of the total cannabis industry and consider a scenario where beer, spirits, wine and cannabis compete for consumer “share of buzz”. This scenario considers switching from alcoholic beverages into any type of cannabis products.

2. **Cannabis infused “alcoholic” beverages** – cannabis infused beverages account for a small part of the cannabis industry. This represents a more direct risk of switching but also an opportunity for beverage companies to participate. We see an emergence of cannabis beverage companies as well as large beverage players getting involved.

1) **Cannabis steal share of buzz from alcohol**

Assuming consumers have a set amount of money to spend on “buzz” we believe spend on cannabis for recreational use could potentially be substituted from alcohol. A key driver of cannabis “stealing share of buzz” from alcohol is the perception that it is a “healthier” way to get a buzz (high/drunk). We consider a number of factors below including hangovers, calories, drink driving and affordability.

**Consumer surveys supportive.** According to a study by Cannabit, 46% of consumers that drink prefer cannabis over alcohol and 28% rate cannabis and alcohol equally. Per a Deloitte study, 41% of Canadian cannabis consumers say they use cannabis as an alternative to alcohol, 82% says they have reduced alcohol consumption when using cannabis and 12% says they have completely quit drinking.

**Better for you.** Alcoholic beverages is at risk of disruption given cannabis’ ability to replicate the effect of alcohol with zero calories, no hangover and with documented health benefits. This resonates well with current beverage trends consumers drinking less, low and no-alcohol and reduced calorie products e.g., botanicals and tonic.

We believe a significant share of consumers switching from alcohol into cannabis will chose beverages. Anecdotally, in California reports show that non-smoking cannabis are taking share from white wine amongst middle aged female consumers.

**An affordable high?** One argument for cannabis over alcohol has been a suggested lower “price per high”. A retail sample shows two pre-rolled joints for c$12 gives you a multiple hour high. This compares to a 6 pack of mainstream beer for c$6 or craft beer for $10-$15. Cannabis infused beverages currently retail at higher prices vs beer and spirits, ranging from $5 to $12 per beer bottle and “hard spirits” elixir bottles at $30. Anecdotally, a consumer in Chicago spends $30 per month on cannabis (1g @ $18) compared to previously spending $30-50 on a night out (c$6 per beer in a bar).

One reason for lower cannabis prices is lower tax. As legalisation of recreational use aims to reduce illicit consumption, legal prices must be comparable with the black...
market. In Canada cannabis priced <$7.70 per gram is taxed $0.77 per gram and >7.70 at a 10% tax. This compares to tax on alcohol c80% spirits, 65%-70% wine, and c50% beer. In California tax on recreational cannabis could be up to 45%, still lower than for alcohol.

**Less drug driving restrictions.** All states in the US and Canada has official regulation and limitations regarding driving under the influence of classified substances. Despite this we believe it is less straightforward to convict someone for drug-driving as cannabis stays in the blood for a prolonged period and it is hard to prove if the driver is currently high or if relates to traces of cannabis from usage several days prior to driving. It is hard to prove the point of consumption even through a blood test, and there is currently no technology allowing for roadside testing similar to a breathalyser for proving drunk-driving. We believe the development of better testing technology and a robust framework similar to that for alcohol, controlling drug driving will be critical for the evolution of the industry.

**What will drive the switch?**

We expect to see an accelerated rate of switching from alcohol to cannabis as it becomes increasingly socially accepted and taboos/stigmas attached are removed. This will come over time from legalisation of cannabis. We believe innovation will also be an important driver of recruitment as the consumer choose between a variety of products not just traditional combustible products such as joints. The lack of shift in consumer behaviour in markets like Amsterdam, where cannabis has been legalised for a longer period, is partly due to a relative lack of product innovation (mainly smoking products) as well as a certain stigma attached to the product from a conservative society.

2) **Cannabis infused beverages**

For cannabis infused beverages we see three key points that will determine what percentage of alcohol drinkers will consider a switch:

- **Product quality:** consumers require great and consistent taste, onset and psychoactive effect from the products. Up to recently we believe product quality has been substandard but with recent technology and product development we believe this is now resolved for allowing consumers to switch with limited variance in quality.

  - **Distribution:** alcohol is today sold c50% on-trade and 50% off-trade. Cannabis is only allowed to be sold via licensed dispensaries with currently almost 0% on-premise consumption. The development of an on-trade channel (dispensary lounges) and potential expansion into broader retail will be key. In California c56% of sales are home delivery (online). Premium consumers don't have time to or want to be seen at dispensaries. Press, marketing and education (parties and events) will also be key.

  - **Regulation:** legalisation of recreational use in additional states and countries.

**Substitution, likely a longer-term evolution**

Conclusions on switching or substitution based on existing data only captures the very short-term effects, with the most advanced legal markets having only existed a few years. We would point to the stickiness of habits and addictions and believe any substitution effect to be small initially, it is unlikely long-term beer drinkers will immediately switch to cannabis but more likely that younger consumers that would have potentially become big beer drinkers in the future – may instead become cannabis users.

According to a 2017 Yahoo News poll a majority of US’s 55m recreational cannabis users are millennials and 75% use cannabis socially. The same study shows that daily cannabis usage amongst students in the 12th grade increased to 5.9% in 2017 up from
1.9% in 1992. At the same time as alcohol consumption amongst young is declining, an annual study with 50k US college students (Monitoring the Future Study) shows % drinking alcohol daily fell to 2.2% in 2017 from 6.5% in 1980. This points to a new divergence in the consumption trend between the two substances.

Per SAMHSA’s (Substance Abuse and Mental Health Services Administration) national survey on drug use and health the average % “cannabis use in past month” across the age groups 12 to 34 has increased from 8.9% in 2000 to 14.5% in 2017, a 62% increase back at similar levels as recorded in the late 1980’s.

Why would people not switch – risks and challenges

Key reasons that will hold back the rate of and possibly prevent switching from alcohol to cannabis we believe, apart from regulation, are consumer uncertainty and lack of knowledge of the products and potential risks.

As long as cannabis is considered illegal in large parts of the world, the stigma and social acceptability will be slow to come down. In our view cannabis will remain a North American, phenomenon for the foreseeable future. Beyond this, we would see Europe and LatAm as the areas for potential industry growth. A further barrier against wider adoption includes the fact that most essential services, banks, credit card processors, insurance, co-packers and distributors, will limit their exposure to cannabis until there is full legalisation. Distribution with sales only allowed in specific controlled outlets (dispensaries) is another headwind.

Particularly when it comes to edible (drinkable) products, to date the inconsistency and uncertainty of the experience you get we believe has prevented consumers from wanting to shift. On this point we believe recent product development is close to meeting and guaranteeing consumers a consistent and predictable experience.

What is the evidence that there will be an impact on alcohol?

There are numerous studies available looking at the potential impact of cannabis to alcohol, that arrive at multiple different conclusions, both negative (substitution) and positive (complementary). We look at a few studies:

**States with medical cannabis laws sees beer and wine sales -15%.** Per a study published in December 2017 (Baggio, Michele and Chong, Alberto and Kwon, Sungoh, “Helping Settle the Cannabis and Alcohol Debate: Evidence from Scanner Data”), the authors compared alcohol sales (2006-15) using Nielsen retail data between states that did and did not pass medical cannabis laws. Key findings included:

- In states that introduce medical cannabis laws, consumption dollars of alcohol sales decreased -15% measured through Nielsen retail scanner data.
- In counties along borders with legal access to cannabis had -20% lower alcohol sales than those across the border in states without medical cannabis laws.
IWSR - Legal Cannabis a Long-term Risk to US Beverage Alcohol. IWSR Drinks Market Analysis together with BDS Analytics have published a study (February 2019) that shows up to 40% of >21 year olds consume cannabis in states where it is legal. Millennial consumers account for 45% of "dualists" defined as consumers using both alcohol and cannabis. The report concludes that there are areas where alcohol and cannabis can co-exist but that the risk to beverages alcohol is expected to increase as consumption and acceptance rise. The study also states in states where cannabis is legalised:

- Adult alcohol consumers 2x cannabis consumers
- 2/3 of cannabis consumers also consume alcohol
- 1/3 of alcohol consumers also consume cannabis
- 50% have ever combined alcohol and cannabis, only few combine regularly
- Dualists drink more beer or spirits rather than wine
- >Baby Boomers consume only alcohol
- >Millennials are dualists or consume only cannabis
- 44% of dualists say cannabis and alcohol should be sold in the same stores

DISCUS – no impact on spirits sales from recreational cannabis legalisation. The Distilled Spirits Council (DISCUS) has published a research report looking at state level tax data and alcohol shipment data for Colorado (4-years legal), Washington (4-years) and Oregon (3-years). The report looks at data for the two years ahead of legalisation and 3-4 years after. It shows no negative impact on spirits sales, which has continued to increase post legalisation. For beer and wine retail sales has been flat to declining, but not at a higher rate than the rest of the US.

### Exhibit 15 - Spirits sales prior to and post medical legalisation of cannabis

![Per Capita Sales Index](image)

Source: Jefferies, DISCUS

What does the alcohol industry want?

DISCUS has published a cannabis policy principle that it urges states to consider before legalising cannabis considering tax, regulation, road safety and social responsibility standards. DISCUS emphasises the spirits industry’s long-term work for responsible drinking and driving a long-term trend of less underage drinking and drink driving. The cannabis industry offers a whole new set of dangers for the consumer and regulation and responsibility from industry actors will be critical.

**TTB formula and label approvals.** Alcohol manufacturers are regulated by the Alcohol and Tobacco Tax and Trade Bureau (TTB) which requires approval and certification for all new drink products before launch. TTB recently issued a statement saying they will not approve formulas or labels for alcohol beverage products that contain controlled substances under federal law. All parts of the Cannabis plant are defined as controlled

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substances under the Controlled Substances Act (CSA). Per the Farm Bill December 2018 Hemp derived CBD is now an approved ingredient but requires pre-approval from TTB.

When needed TTB will consult the FDA regarding ingredient safety or order the applicant to apply for documentation from the FDA to prove the use of a proposed ingredient does not violate the Federal Food, Drug and Cosmetic Act.

**Alcohol Industry Associations warming up to cannabis.** In July 2018, the Wine & Spirits Wholesalers of America (WSWA) was the first beverage alcohol association to publish an official policy supporting states’ right to establish a legal, regulated adult-use cannabis market. WSWA is the national trade association representing 370 wine and spirits wholesalers in 50 states, control >80% of all wine and spirits sold.

WSWA called for the federal government to respect the states right to legalise adult-use if they adopt a regulatory framework like that of alcohol. They outline a set of guidelines:

- Minimum age 21 (purchase, possess and use)
- Penalties for providing cannabis to underage consumers
- Establishment of Driving Under the Influence impaired driving standards
- Licensing producers, processors, distributors and retailers
- Policies to prevent vertical monopoly/integration
- Hours and days of sale parity with alcohol
- Tax collection and enforcement
- Measures to prevent diversion of cannabis to non-legal states
- Restrictions on sale/common carrier delivery
- Labelling requirements that include potency and health requirements
- Testing of formulas to ensure product purity and consistency
- Advertising restrictions designed to discourage underage access and promote responsible consumption
- Restrictions on health claims on packaging
- Establishment of a designated agency overseeing cannabis industry regulation
- Penalties for licensee violations on par with the state’s alcohol regulations
- Regulations to ensure all products can be tracked/traced to processor/producer

**Alcohol distributors getting ready to take on cannabis.** A couple of spirits, wine and beer distributors/wholesalers have announced they are getting involved in the Cannabis industry. As we have highlighted in this report, we see sales and distribution of cannabis relatively similar to that of beverages alcohol, both in terms of regulation and consumption occasions. Longer term alcohol distributors should be well placed to take on cannabis as well.

Breakthru Beverage Group (leading premium spirits, wine and beer wholesaler) has signed an exclusive partnership with leading cannabis company CannTrust where Breakthru will set up a route to market and sales co to distribute CannTrust's adult use products in Canada. Breakthru has taken a c$9.2m stake in CannTrust as part of the agreement.

Southern Glazer’s Wine and Spirits (SGWS) the US largest spirits wholesaler has set up a subsidiary in Canada, Great North Distributors, which will distribute Aphria’s products across Canada with a dedicated cannabis focused salesforce. This includes all Aphria products, also flower.

Please see important disclosure information on pages 42 - 47 of this report.
What does Jefferies’ cannabis analyst say?

Cannabis is increasingly used as a substitute for alcohol (and not just beer)
For us, the most obvious sector at risk of disruption from cannabis is alcohol. As cannabis can replicate the effect of alcohol but with zero calories and no hangover, the appeal is obvious.

Another advantage is that cannabis is a neuro-activator vs alcohol a neuro-inhibitor. While cannabis is known to help with a variety of medical conditions, reduce anxiety and stress, alcohol has been linked to 12 serious diseases.

Another consideration is taxation
The premise for recreational legalisation of cannabis in Canada was to eliminate the black market. To do this, legal cannabis prices have to be comparable to black market prices which means cannabis tax is generally set lower than alcohol. In Canada the tax is $0.77 per gram (CA $1) for cannabis costing up to $7.70 (CA $10), and a flat 10% tax on more expensive strains. On alcohol, the tax is c80% for spirits, 65%-70% for wine, and c50% for beer. The tax gap may cause some consumers to switch from alcohol to cannabis. We would note that tax on cannabis is not always as low as in Canada. In California tax on recreational cannabis could be up to 45%, still lower than for alcohol.

Sociable drinking
Some may argue the ritual of drinking with friends is part of alcohol’s appeal, particularly its social appeal. With innovation and new product development in terms of cannabis infused beverages this is becoming possible also with cannabis.

The appeal of cannabis over alcohol is already starting to be seen in the US. A 2018 paper from the University of Connecticut and Georgia State University examined changes in alcohol sales at grocery and convenience stores and found cannabis and alcohol to be strong substitutes, with medical cannabis implementation leading to a 15% reduction in monthly alcohol sales. When asked their reasons for using recreational marijuana, 41% of Canadians surveyed in the 2018 Deloitte study listed their recreational use as an alternative for alcohol.

Mainly beer but also wines and spirits
In terms of which alcohol segment is most at risk, many assume it is primarily beer. The argument goes that like cannabis, it indexes 2:1 men to women, carries the most calories, and is often drank primarily to get drunk as opposed to other alcohol such as spirits, and particularly wine, where the taste experience has more to do with it. While these arguments are valid, if we look at the data, it does not appear the other segments are immune.

Some trends we have found particularly interesting are what is going on in wine where we are seeing terpenes introduced to enhance the flavour. In an interview with Forbes, the CEO of House of Saka wines in California said, “By using alcohol free wines sourced from top vineyards in Napa valley and then infusing them with terpenes specifically chosen to replicate flavours in wine, we are able to create an elevated wine occasion – without the alcohol and the calories and hangover that comes with it.”
Quantifying the potential risk to beverages alcohol

Methodology
Jefferies’ cannabis analysts global cannabis forecast, shows 2027 consumption by market. He forecast 2027 medical consumption $17bn and recreational (adult-use) $28.3bn, of which adult-use is 71% US, 24% Canada and 5% Mexico.

We show the 2027 cannabis industry vs beer, spirits and wine, based on Euromonitor’s 2017-2022E growth forecast extrapolated to 2027. This shows how much of global alcoholic beverage retail sales will be sold in the same markets as cannabis, and therefore at potential risk of substitution.

We show three simple analyses of the potential risk to alcohol beverage:

1. Impact to global beverage sales if a range from 5% to 100% of the consumer spend on adult-use cannabis (per Jefferies’ cannabis analyst) is substituted out of the spend on alcoholic beverages. Note, we do not assume any impact from growth of medical. This implies conservative 1% risk to global beverage markets at 100% substitution.

2. Based on a study pointing to 15% decline in alcohol sales in states with medical cannabis laws, we apply a 15% decline to alcoholic beverage sales in each market where medical or adult-use cannabis is legalised.

3. Based on a presentation by Canopy predicting cannabis could disrupt $500bn of value from a range of global consumer industries, assuming equal share of disruption across the highlighted sectors implies 40% of a $1,000bn global alcoholic beverage market at risk.

Jefferies’ cannabis analyst market forecast
Jefferies’ cannabis analyst forecast 2027 global medical cannabis consumption $17bn and recreational $28.3bn, of which recreational is 71% US, 24% Canada and 5% Mexico. Medical use is predominantly N America, with some consumption in Europe (Germany and UK) and ROW. By 2027, 23 markets are assumed to have legalised cannabis on medical or recreational basis.

Our cannabis analyst bases his forecast on BDS data out to 2022, beyond which he applies his own growth forecast to 2027. His base case does not assume US federal legalisation and almost all consumption is derived from illicit with no disruption of other industries. Per Euromonitor, the illicit market is estimated to be worth c$140bn. However, we show in this report the impact to global alcohol if there would be a level of substitution.

In his upside scenario, he models 2027 total global cannabis revenue $130m with the incremental $80m coming from $9m opening up of medical markets (all of LatAm, Europe and US), $39m opening up of recreational markets (LatAm, Europe and US) with US federal legalisation in 2023. The upside case also includes incremental $34bn from disruption of other industries, c$6bn from alcoholic beverages in LatAm, Europe and N America.

Alcoholic beverages exposure to cannabis
By 2027, global alcohol sales from the 23 markets included in the analysis is $1,200bn (43% of total global alcohol) of which 48% is beer, 27% spirits and 25% wine. The US is expected to account for 71% of total cannabis sales but only 15% of beer and wine and 11% of spirits.
We believe that a large part of global beverages will be protected due to strict drug laws and we see little opportunity of legalisation e.g., in most parts of Asia like China and Japan.

**Results of analysis 1 – 1% of global alcohol at risk, 6% of US alcohol**

Assuming consumers have a set amount of money to spend on “buzz” we show for each market where adult-use cannabis spending is forecasted to take place, the impact to total beverage alcohol sales if 5-100% of adult-use cannabis spend is substituted from alcohol.

A worst-case scenario, if 100% of the $28.2bn adult use cannabis spend is substituted out of alcohol, this is worth c1% to global beverage alcohol ($2,853bn).

With all the forecasted adult-use taking place in US, Canada and Mexico the impact if the $28.2bn is substituted out of alcoholic beverages in these markets ($508bn) is worth c6%.

Looking at the US market specifically we forecast $21.7bn adult use cannabis sales. If 100% of this is substituted from alcohol this is worth c6% – assuming a fair share comes out of each of the categories this implies retail sales at risk for beer $9.6bn, spirits $7.1bn and wine $5bn based on the size of the categories.

Our cannabis analyst models for most of the $45bn cannabis revenue to be derived from the illicit market, with little disruption of other categories. In his upside scenario he models total global cannabis revenues $130bn of which $34bn comes from disruption of other industries. He models for 2.5% of the beer and 1% of the spirits market in US, Canada, LatAm and Europe at risk which implies incremental $6bn cannabis revenue. What we highlight here is an illustrative worst-case scenario.

**Results of analysis 2 – 15% of individual markets, 7% of global alcohol at risk**

The second analysis applies the “evidence” presented in external research studies that medical cannabis laws have a negative impact on alcohol sales (the referenced study points to 15% decline in beer and wine sales in states with medical cannabis laws, spirits not included due to low coverage of sales outlets but a similar impact is expected).

A 15% decline in markets where cannabis is legalised (medical or recreational) implies a 6.5% decline in global alcohol sales (including spirits), assuming no change to alcohol sales in markets not included in the forecast.

Looking at the US market a 15% decline in alcohol sales is worth $26bn to beer, $19bn to spirits and $13bn to wine.

**Results of analysis 3 – 40% of alcohol at risk**

Canopy Growth, one of the leading cannabis companies hosted a presentation (Driving the Global Cannabis industry) in February 2019 outlining the potential future size of the industry. The presentation outlines the size of the illicit market as $3bn Canada medical, $5-9bn Canada recreational and $180bn international medical.

The presentation also highlights the company believe that cannabis could potentially disrupt $500bn from a wide range of global consumer markets. Target markets includes athletic drinks ($40bn), animal health ($50bn), pain relief ($90bn), sleep aids ($100bn) and beverage alcohol ($1000bn). Assuming the $500bn is captured “fair share” from the targeted industries implies $391bn (c40%) of the beverage alcohol market is at risk.

Please see important disclosure information on pages 42 - 47 of this report.
Exhibit 16 - Canopy indicates cannabis could disrupt up to $500bn

Source: Jefferies, Canopy Growth Corp
### Exhibit 17 - Alcoholic beverage markets at risk of disruption from cannabis

<table>
<thead>
<tr>
<th>Market</th>
<th>Cannabis $ sales by 2027</th>
<th>Beer $ value at risk if adult-use cannabis take share</th>
<th>Alcohol $ value at risk if adult-use cannabis take share</th>
<th>% of alcohol market at risk</th>
<th>Alcohol decline</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Medical</td>
<td>Adult-use</td>
<td>Total</td>
<td>2027 $ value</td>
<td>2027 $ value</td>
</tr>
<tr>
<td>Germany</td>
<td>2,192</td>
<td>2,192</td>
<td>4.8%</td>
<td>37,142</td>
<td>22,606</td>
</tr>
<tr>
<td>Italy</td>
<td>338</td>
<td>338</td>
<td>0.7%</td>
<td>15,575</td>
<td>11,708</td>
</tr>
<tr>
<td>UK</td>
<td>1,177</td>
<td>1,177</td>
<td>2.6%</td>
<td>35,692</td>
<td>24,573</td>
</tr>
<tr>
<td>Spain</td>
<td>211</td>
<td>211</td>
<td>0.5%</td>
<td>26,731</td>
<td>12,878</td>
</tr>
<tr>
<td>Netherlands</td>
<td>185</td>
<td>185</td>
<td>0.4%</td>
<td>9,289</td>
<td>3,354</td>
</tr>
<tr>
<td>Switzerland</td>
<td>355</td>
<td>355</td>
<td>0.8%</td>
<td>4,923</td>
<td>1,718</td>
</tr>
<tr>
<td>France</td>
<td>76</td>
<td>76</td>
<td>0.2%</td>
<td>15,929</td>
<td>21,911</td>
</tr>
<tr>
<td>Austria</td>
<td>59</td>
<td>59</td>
<td>0.1%</td>
<td>5,854</td>
<td>2,201</td>
</tr>
<tr>
<td>Belgium</td>
<td>36</td>
<td>36</td>
<td>0.1%</td>
<td>6,194</td>
<td>1,290</td>
</tr>
<tr>
<td>Portugal</td>
<td>34</td>
<td>34</td>
<td>0.1%</td>
<td>3,579</td>
<td>1,358</td>
</tr>
<tr>
<td>Poland</td>
<td>93</td>
<td>93</td>
<td>0.2%</td>
<td>10,329</td>
<td>9,292</td>
</tr>
<tr>
<td>Finland</td>
<td>20</td>
<td>20</td>
<td>0.0%</td>
<td>3,538</td>
<td>1,145</td>
</tr>
<tr>
<td>Brazil</td>
<td>151</td>
<td>151</td>
<td>0.3%</td>
<td>87,279</td>
<td>23,723</td>
</tr>
<tr>
<td>Argentina</td>
<td>117</td>
<td>117</td>
<td>0.3%</td>
<td>26,592</td>
<td>13,526</td>
</tr>
<tr>
<td>Uruguay</td>
<td>120</td>
<td>120</td>
<td>0.3%</td>
<td>1,203</td>
<td>418</td>
</tr>
<tr>
<td>Peru</td>
<td>43</td>
<td>43</td>
<td>0.1%</td>
<td>15,441</td>
<td>2,818</td>
</tr>
<tr>
<td>Colombia</td>
<td>20</td>
<td>20</td>
<td>0.0%</td>
<td>15,452</td>
<td>2,750</td>
</tr>
<tr>
<td>Canada</td>
<td>1,404</td>
<td>7,099</td>
<td>7,403</td>
<td>16.3%</td>
<td>18,596</td>
</tr>
<tr>
<td>Mexico</td>
<td>931</td>
<td>480</td>
<td>1,411</td>
<td>3.2%</td>
<td>46,123</td>
</tr>
<tr>
<td>US</td>
<td>9,997</td>
<td>21,655</td>
<td>31,052</td>
<td>68.6%</td>
<td>171,702</td>
</tr>
<tr>
<td>Australia</td>
<td>81</td>
<td>81</td>
<td>0.2%</td>
<td>31,483</td>
<td>8,749</td>
</tr>
<tr>
<td>Israel</td>
<td>75</td>
<td>75</td>
<td>0.2%</td>
<td>1,584</td>
<td>1,294</td>
</tr>
<tr>
<td>New Zealand</td>
<td>23</td>
<td>23</td>
<td>0.1%</td>
<td>3,240</td>
<td>1,435</td>
</tr>
<tr>
<td>ROW</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.0%</td>
<td>558,005</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>17,038</strong></td>
<td><strong>28,254</strong></td>
<td><strong>45,292</strong></td>
<td><strong>100%</strong></td>
<td><strong>1,151,453</strong></td>
</tr>
</tbody>
</table>

### Scenario 1

**US market (2027)**

- **Beer**: 171,702
- **Spirits**: 126,698
- **Wine**: 89,198

**Revenues lost to cannabis**

- Beer: 9,593
- Spirits: 7,079
- Wine: 4,983

**% lost to cannabis**

- Beer: 5.6%
- Spirits: 5.6%
- Wine: 5.6%

### Scenario 2

**US market (2027)**

- **Beer**: 171,702
- **Spirits**: 126,698
- **Wine**: 89,198

**Revenues lost to cannabis**

- Beer: 25,755
- Spirits: 19,005
- Wine: 13,380

**% lost to cannabis**

- Beer: 15.0%
- Spirits: 15.0%
- Wine: 15.0%

Source: Jefferies estimates, BDS, Euromonitor

Please see important disclosure information on pages 42 - 47 of this report.
Cannabis substitution risk limited to North America

Although the “headline risk” of cannabis might send ripples through the global beverage markets, the geographic concentration of forecasted cannabis sales implies the substitution risk to alcoholic beverages sales is limited to a few markets.

Exhibit 16 shows percentage of retail sales revenue (per Euromonitor) generated in the 24 markets for the companies we cover. We highlight in pink the markets where cannabis is expected to be legalised for adult-use. This shows when looking at adult-use, Remy at biggest risk (45%) ahead of ABI (38%), Diageo and Campari (c30%), Heineken (25%) and Pernod (23%). The beverage companies we cover that are most exposed to the US market are Remy 44%, ABI 27%, Campari 26%, Diageo 24%, Pernod 17% and Heineken 12%.

Exhibit 18 - Company exposure to markets with medical / adult-use legalisation ($ RSV)

<table>
<thead>
<tr>
<th>Market</th>
<th>ABI</th>
<th>HEINEKEN</th>
<th>CARLSBERG</th>
<th>DIAGEO</th>
<th>PERNOD</th>
<th>REMY</th>
<th>CAMPARI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>2,805</td>
<td>207</td>
<td>2,378</td>
<td>1,177</td>
<td>1,925</td>
<td>245</td>
<td>1,333</td>
</tr>
<tr>
<td>Italy</td>
<td>1,158</td>
<td>2,536</td>
<td>512</td>
<td>1,089</td>
<td>796</td>
<td>27</td>
<td>1,738</td>
</tr>
<tr>
<td>UK</td>
<td>6,364</td>
<td>4,617</td>
<td>3,240</td>
<td>5,778</td>
<td>1,873</td>
<td>121</td>
<td>430</td>
</tr>
<tr>
<td>Spain</td>
<td>740</td>
<td>5,651</td>
<td>153</td>
<td>1,526</td>
<td>2,605</td>
<td>14</td>
<td>69</td>
</tr>
<tr>
<td>Netherlands</td>
<td>928</td>
<td>1,936</td>
<td>0</td>
<td>316</td>
<td>328</td>
<td>65</td>
<td>56</td>
</tr>
<tr>
<td>Switzerland</td>
<td>109</td>
<td>1,211</td>
<td>1,648</td>
<td>212</td>
<td>249</td>
<td>68</td>
<td>106</td>
</tr>
<tr>
<td>France</td>
<td>1,718</td>
<td>3,861</td>
<td>3,263</td>
<td>1,229</td>
<td>5,639</td>
<td>211</td>
<td>137</td>
</tr>
<tr>
<td>Austria</td>
<td>83</td>
<td>2,436</td>
<td>8</td>
<td>127</td>
<td>238</td>
<td>52</td>
<td>103</td>
</tr>
<tr>
<td>Belgium</td>
<td>2,421</td>
<td>646</td>
<td>137</td>
<td>357</td>
<td>210</td>
<td>31</td>
<td>50</td>
</tr>
<tr>
<td>Portugal</td>
<td>0</td>
<td>1,062</td>
<td>98</td>
<td>220</td>
<td>121</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Poland</td>
<td>0</td>
<td>2,429</td>
<td>1,493</td>
<td>276</td>
<td>821</td>
<td>16</td>
<td>18</td>
</tr>
</tbody>
</table>

| Brazil       | 28,284| 8,433   | 0         | 2,094  | 1,360  | 0     | 730     |
| Argentina    | 3,645  | 317     | 0         | 196    | 564    | 0     | 365     |
| Uruguay      | 447   | 41      | 0         | 80     | 46     | 0     | 1       |
| Peru         | 4,555  | 0       | 0         | 134    | 104    | 0     | 14      |
| Colombia     | 7,123  | 124     | 0         | 280    | 92     | 0     | 1       |
| Canada       | 5,865  | 541     | 23        | 2,253  | 1,576  | 80    | 428     |
| Mexico       | 12,377 | 8,637   | 4         | 2,651  | 908    | 0     | 81      |
| US           | 44,585 | 8,930   | 103       | 15,166 | 7,994  | 1,951 | 2,260   |
| Australia    | 6,632  | 443     | 93        | 1,413  | 1,243  | 43    | 304     |
| Israel       | 161   | 224     | 293       | 139    | 110    | 17    | 23      |
| New Zealand  | 178   | 699     | 16        | 156    | 493    | 16    | 57      |
| ROW          | 36,618 | 18,100  | 24,761    | 26,693 | 17,023 | 1,528 | 276     |
| **TOTAL**    | 166,894 | 72,875  | 37,218    | 92,564 | 48,156 | 4,481 | 8,559   |

% exposed 75% 75% 33% 33% 33% 66% 66% 37%

Adult use [%] 38% 25% 0% 31% 23% 45% 32%

US 27% 12% 0% 24% 17% 44% 20%

Source: Jefferies, BDS analytics, Euromonitor. Note this is based on Euromonitor, not co data

Largely a N American phenomenon

Although initial steps are being taken towards international legalisation, Cannabis is largely a N American phenomenon with 98% of adult-use and 63% of medical use 2027. The impact if the $28.1bn cannabis revenue is substituted out of the N American (incl. Mexico) alcohol beverage industry ($508bn) this is worth 6%.

Looking at the US market we forecast $21.7bn adult use cannabis sales. If 100% of this is substituted from alcohol this is worth 6% – assuming a fair share comes out of each of the categories this implies retail sales at risk for beer $9.6bn, spirits $7.1bn and wine $5bn based on the size of the categories.

A 15% decline in alcohol sales in the US, per the external study referenced, would be worth $26bn to beer, $19bn to spirits and $13bn to wine.

More of a risk to beer and wine than for spirits?

According to a 2017 national survey on drug use, past month cannabis use rates show a relatively strong relationship with education and employment, suggesting economic factors are a large dictator for potential adoption. We believe this is reflected in an inverse relationship for age-related use after peaking with 18-25 years olds. Hispanics,
Asian and females are generally less likely cannabis users. In 2015 the study showed cannabis use rates per family income group with significantly higher use rates for lower income families with 13.6% for <$10k/year compared to 9.7% $20k-$29k, 7.8% $50k-75k and 6.6% >$75k.

Across all age/demographic groups past month usage rates has increased in 2017 vs 2016 apart from amongst unemployed and 12-17-year olds.

**Exhibit 19 - Cannabis use rates in past month by age group and demographics (2016 and 2017)**

While the data remains inconclusive whether cannabis is a complement or substitute to alcohol we believe trends are pointing more towards a substitute risk scenario. As indicated by the CBHSQ Survey, cannabis users skew to lower education, unemployed, lower-income which we believe places beer most at risk of cannabis adoption as the average price of spirits and wine are c6.5x and 3.5x that of beer.

Taking this logic one step further it could be argued that it leaves lower-end mainstream beer most disadvantaged due to the income profile of cannabis users, where ABI and Molson Coors portfolios are highly exposed. Constellation on the other hand should be less at risk with its portfolio skewed towards high-end imports and Hispanics (40% of Constellation’s consumption).

**Spirits and Wine bigger threat than Cannabis**

Our analyses suggest c$9.6bn of the total US beer market ($171bn) could be at risk of disruption from cannabis.

Over the past 10 years from 2007 to 2017, beer has lost 392bp share of supplier gross revenue to wine and spirits ($2.8bn) and 301bp share of retail sales ($6.7bn lost). Over the next ten years we model a continued share loss for beer to wine and spirits. We model for c277bp retail share loss by 2027 worth $10.7bn of retail sales.
Exhibit 20 - US Beer, Spirits and Wine share of throat

Source: Jefferies estimates, DISCUS

Exhibit 21 - US 2027 beer retail sales at risk of disruption

Source: Jefferies estimates, DISCUS, BDS

Exhibit 22 - US beer, spirits and wine share of throat 1991-2027E

Source: Jefferies estimates, DISCUS, Euromonitor

Please see important disclosure information on pages 42 - 47 of this report.
The size of the market

How big is the cannabis market – as many sources as numbers

For this report we use Jefferies’ cannabis analysts forecast for the global cannabis market. His forecast is based on BDS research’s definition and sizing of the legal cannabis out to 2022 by market, then extrapolated per his independent growth forecasts.

Per BDS, the size of the legal cannabis market was $9.5bn in 2017 split $6.7bn medical and $2.8bn adult-use. In 2018, per the latest published update this had increased to $5.8bn medical and $6.3bn adult-use. This is projected to reach $45.3bn by 2022 ($17bn medical and $28.3bn adult-use).

Exhibit 23 - Jefferies forecast of the global legal cannabis market to 2027

Source: Jefferies estimates, BDS

We highlight several sources and estimates pointing to varying sizes today and in the future, both for legal and illegal. Per global market insights the market for medical cannabis is expected to grow at a CAGR of 36% p.a. from $7.2bn in 2017 to over $55bn by 2024.

Euromonitor defines the global cannabis market in 2015 worth $5.46bn legal and $140bn illegal with the legal part expected to reach at least $50bn by 2025. In Canada, the legal market is estimated to be $0.04bn vs illegal $3.9bn (2015); in the US, the legal market is estimated to be $5.4bn vs illegal $40bn; in Europe and rest of the world, the legal market is estimated to be $0.02bn vs illegal $25bn.

Per New Frontier Data, the US cannabis market reached $8.3bn legal and $26.6bn illicit in 2017 and will reach $23bn legal (+14% CAGR) and $31.8bn illicit (+2% CAGR) by 2025.

Exhibit 24 - Various sources sizing cannabis market 2015/17

Source: Jefferies, BDS, Global Markets Insights, Euromonitor

Cannabis CEO’s paint Blue Sky scenarios

Please see important disclosure information on pages 42 - 47 of this report.
In an investor presentation, Brendan Kennedy, CEO of Tilray, outlined they are targeting a $150bn cannabis market, citing a United Nations World Drug Report as source.

Bruce Linton, founder of Canopy, states that cannabis has the potential to disrupt up to $500bn of value out of a wide range of consumer goods industries – on top of illicit cannabis worth c$200bn.

Cannabis in the context of consumer staples
Per Euromonitor, cannabis was a $150bn global industry in 2015 legal and illegal, per BDS in 2017 the legal industry was valued $9.5bn (we estimate the illicit worth $140m). This compares to the 2017 retail sales value, based on Euromonitor data, of beer $661m, spirits $532m, wine $343m and soft drinks $817m.

Euromonitor forecast sector growth out to 2022, we extrapolate Euromonitor’s growth forecast out to 2027 and arrive at global beer worth $1,151bn, spirits $1,105bn, wine $596bn and soft drinks $1,097bn. This compares to Jefferies’ estimate for global legal cannabis worth $45bn. This does not consider any cannibalization or slowdown in other categories, but purely illustrates Euromonitor’s forecast.

Exhibit 26 - 2017 size of consumer goods sectors (RSV)

Exhibit 27 - 2027 size of consumer goods sectors ($ RSV)

Where will consumption take place?
Based on Jefferies forecast the market will evolve from broadly equally split medical (48%) and adult use (52%) in 2018 to 62% adult-use and 38% medical by 2027.

Exhibit 28 - 2018 split of market medical vs adult use
Exhibit 29 - 2027 projected market split medical vs adult use

Per 2018, nearly 100% of all legal cannabis is sold in N America. Jefferies forecast 2027 recreational use 71% US, 24% Canada and 5% Mexico (Uruguay <1%) with a more geographic spread for medical use.
And in what shape or form?

There are three key ways to consume cannabis: inhalation, ingestion (metabolic/sublingual), and topical. Across these three consumption methods there are a range of products available include smoking, vaporising, edibles, infused beverages, sprays and creams.

Spending on edibles was $1bn in 2017 (US and Canada) and BDS projects >$4.1bn 2022. Non-smoking (flower) consumption is healthier removing the combustion element. Consumer surveys in Colorado and California shows 64% and 55% of adult-use consumers has tried edibles in the last six months (vs inhaled 81% and 88%).

By 2022 BDS forecast 36% flower, 36% concentrates, 14% edibles and 14% other.

Molson Coors’ CEO Mark R Hunter has projected cannabis infused beverages could take 20-30% share of the total US cannabis industry ($20bn). Cannabiniers have outlined an outlook where beverages capture up to 20% of the edible segment.
on factors such as cannabis consumption rates, decriminalisation and legalisation history, opinion polls, political climate etc. Adult-use spending per consumer is based on GreenEdge’s US baseline adjusted for GDP per capita levels. Each market’s cannabis consumer forecast (less assumed medical users) is then multiplied by the spending per consumer forecast.

**Jefferies cannabis analysts’ forecast**

Jefferies cannabis analyst uses BDS data out to 2022 then applies his independent growth rate estimates for each market from there to 2027. In his base case he assumes almost all consumer spending on cannabis will be derived from the illicit market, with no disruption of other consumer industries. In his base case he does not assume federal legalisation, in his upside case he models US federal legalisation of recreational use in 2023.

**Mainly at the expense of illicit consumption**

The evolution of the cannabis industry is unique in the way that the consumer product category does not have to be created from scratch attracting new consumers and educating them on how to use the products. The task lies in shifting existing spending from illicit to legal channels. Although the illicit market provides a great source of ready to access customers it also poses a significant threat to growth of the legal market if overly strict taxation and regulation makes the legal companies uncompetitive.

To date we have seen a reduction in illicit spend in states where adult-use has been legalised, only modest shift in states with medical laws only.

Interviews with industry players points to that cannabis infused beverages will likely reduce the barriers for non-cannabis users to entry into the category. Beverages offer a more sociably accepted and discrete way of consuming cannabis without the well-known smell or taste and with no combustion involved. Also compared to other edibles, the beverage products as quality improves offers a more reliable, consistent experience with shorter onset.

**Exhibit 34 - Illicit cannabis trade as % of total spending in 2017**

![Exhibit 34 - Illicit cannabis trade as % of total spending in 2017](source: Jefferies, BDS)
The world of weed

What is cannabis?
Cannabis Sativa (energetic, uplifting) and Cannabis Indica (relaxation, sleep and anxiety) are the two main families of the cannabis plant, the two families can be combined into hybrids. The cannabis plant contains over 100 active compounds that interact with cells in the brain, central and peripheral nervous system with cannabinoid receptors, to create various effects.

The two most common cannabinoids are THC (tetrahydrocannabinol) with both psychoactive and medical effects and CBD (cannabidiol) with no psychoactive effects. Both Sativa and Indica cannabis contain THC whereas Hemp contains CBD but none or less than 0.3% THC.

In addition to the main cannabinoids THC and CBD there are a number of additional active compounds that play a role in the therapeutic and psychoactive effects of the cannabis. Researchers have identified several phytocannabinoids as well as several hundred aromatic chemical compounds called Terpenes that create the various smells and flavours but also contributes to the wide range of therapeutic/psychoactive experiences.

Exhibit 35 - Variants and effects of Sativa and Indica strain

<table>
<thead>
<tr>
<th>Amplify</th>
<th>Relief</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sativa strain</td>
<td>Sativa and Indica strain</td>
</tr>
<tr>
<td>Increased focus</td>
<td>Pain relief</td>
</tr>
<tr>
<td>Heightened creativity</td>
<td>Decrease stress</td>
</tr>
<tr>
<td>Pleasure, euphoric</td>
<td>Alleviate emotional and physical pain</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Relax</th>
<th>Sleep</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sativa and Indica strain</td>
<td>Indica strain</td>
</tr>
<tr>
<td>Helps unwind</td>
<td>Ideal for resting</td>
</tr>
<tr>
<td>Good for relaxing</td>
<td>Helpful to feel refreshed</td>
</tr>
<tr>
<td>Calm nerves and alleviate tension</td>
<td>Helps muscles and body to feel heavy</td>
</tr>
</tbody>
</table>

Source: Jefferies, Cannabiniers

How is it consumed?
There are three main methods to consume cannabis: inhale (smoke or vape), ingest either via sublingual or metabolic uptake or topical/transdermal which is absorbed via the skin. A wide range of products offer cannabis across these methods such as smoking devices, vapourisers, edibles, beverages, sprays, and creams.

- **Inhalation**: absorption through inhaling combusted or vapourised cannabis. This leads to an onset within 2-2.5 minutes and the effects reach the entire body. Vaping cannabis oils allows for the rapid onset without exposure to the carcinogens of combustion. **Products**: joints, pipes, bongs, vape pens.
- **Ingestion – sublingual**: uptake of cannabis through the lining of the mouth and under the tongue – the onset typically takes 15-45 minutes and the effects reach the entire body. Uptake should take 15-60 minutes. **Products**: tinctures, oral spray.
- **Ingestion – metabolic**: cannabinoid molecules are absorbed in the intestines and metabolised in the liver. This leads to an onset from 30 minutes up to 2 hours (or longer). When cannabis is metabolised in the liver a potent THC metabolite (11-hydroxy THC) is formed which has a higher affinity to bind cannabinoid receptors and is 5-10x as psychoactive than the ingested THC. This, together with factors like how much you have eaten before makes the effect more varied and volatile. **Products**: edibles (chocolate, gummies, cakes), beverages and pills.
- **Topical/Transdermal**: absorb cannabinoids through the skin, local effect only as the cannabinoids does not enter the bloodstream. **Products**: creams, gels.

Please see important disclosure information on pages 42 - 47 of this report.
What are Edibles?
Edibles are defined as food and beverages infused with cannabis, typically with a cannabis distillate which offers a nearly 100% pure base for consistent and reliable mix and no cannabis flavour or aroma.

The chemical compounds are extracted from the cannabis flower to create a concentrate, the concentrate normally has a potency (concentration of cannabinoids) of 60-90% compared to the cannabis flower at 20-30%. The concentrate is further refined to the point where individual cannabinoids and terpenes are isolated and recaptured – this is called a distillate. The distillate is crucial for edibles where specific THC or CBD potency has become a key selling point for consumers.

There are a range of edible (candies, chocolates and chewing gums but also more health focused products like granola or food sprinkles) and drinkable products. Edible cannabis consumption is said to give a slightly different high compared to smoking, more a “body high” than a “head high” feeling.

Cannabis infused beverages
We divide the drinkable products into three main categories:

- THC infused beverages (soft drinks, elixirs) as an alternative way to consume cannabis avoiding smoking/inhaling
- Health focused, functional beverages infused with THC (energy drinks) or CBD (recovery drinks) such as waters, coffees, teas and energy drinks
- Non-alcoholic, THC and/or CBD infused “alcohol replicas” such as cannabis infused beer, wine and spirits extracts

Some of the key challenges for cannabis infused beverages is that oil-based cannabis distillate does not easily mix with liquids, so the beverage producer must use water soluble cannabinoids. It is also critical that the cannabinoids are evenly dispensed through the liquid. To replicate the effects of alcohol (but also to some extent energy drinks) both the onset and the duration of the high needs to be much quicker/shorter than the standard for metabolic ingestion.

Several cannabis ingredient and beverage companies are developing proprietary technologies to deliver a faster more reliable onset and duration:

- Cannabis ingredient company Stillwater’s RIPPLE SC is a standardised, clean-label, water soluble and shelf-stable hemp-derived cannabinoids with no flavour or odour and 15 minutes onset and max absorption after 45-60 minutes.
- US based Tarukino uses its proprietary water-soluble Sörse technology which guarantees no taste or smell.
- Cannabiniers craft beer brand Two Roots Brewing is infused with a water-soluble micro-dose that is absorbed by the body within 5-7 minutes and dissipates over 90 minutes (supplied by CannaCraft).
- Tinley have developed products where you have some initial onset immediately and c70% within 20 minutes (c10-15min behind alcohol). Tinley is launching its next generation of products in 1Q19. Next generation products to be launched early 2019 will be even more advanced.

In July 2019, San Francisco will host the first Cannabis Drinks Expo creating a forum for venture capitalists and investors to meet with cannabis infused beverage companies and cannabis growers.

How much should I eat or drink?

Please see important disclosure information on pages 42 - 47 of this report.
There are numerous recommendations and guidelines for how much cannabinoids to consume and products are offered at varying strengths.

In legal markets (Canada, California and Oregon) the standard dose for edibles is 10mg THC which corresponds to smoking c30-50% of a 1gram joint of cannabis with c15-25% potency. When smoking cannabis only c37-50% of the TCH content is absorbed into the blood (fallout during combustion and inhalation), when eating or drinking TCH 90-95% is absorbed by the body.

One source (Dixie Elixirs) defines one serving for edibles as 1-5mg and recommends for rookies 1 serving (1-5mg), novice 2 servings (5-10mg) and pro three servings (10-15mg).

**Where can I buy it**

Legalised cannabis must be sold through dispensaries, it is strictly forbidden to sell alcohol and cannabis products within the same outlets.

To date there is very little on-premise consumption only through a few cannabis lounges, typically in connection with dispensaries, with almost all of consumption taking place at home (off-trade).

We would highlight the restriction for selling cannabis and alcohol in the same outlets as one of the main barriers for cannabis infused drinks to encourage consumers to switch from alcoholic alternatives. In California, the worlds largest market for recreational, legal use of cannabis we believe c50% is sold on-line (home delivery).

**Functional beverages – cannabis as a health booster**

There is a risk that cannabis, given the energising properties of THC could take a share of the energy drinks market, while the healing properties of CBD can capture a share of the sports recovery drink market.

A trend within the edibles space is "microdosing" which implies consuming very low levels of cannabis to access restorative health benefits, without getting a high. Cannabis infused beverages plays very well to this trend where sipping a low dosage drink throughout the day consumers can achieve an even sense of relaxation or focus.

We are already seeing a wide range of cannabis infused soft drinks offering different functional and health benefits. E.g., in the shape of tea, coffee (RTD, powder and pods) and energy drinks.
Cannabis infused beverages - who does what?

Typically, the value chain for producing cannabis infused edibles contains multiple players. The consumer facing brand company is more FMCG like and tend to purchase cannabis from downstream manufacturers. There are some companies that span the entire value chain, and many manufacturers/extractors also produce a range of own brands. But, looking at most of the dedicated cannabis infused drinks companies, these have little intention of backwards integration into the more “commoditised” processes.

At the start of the value chain – Cannabis manufactures

We give a short overview of a few selected cannabis manufacturers that are also involved in cannabis-infused beverages:

**Canopy Growth (covered by Jefferies).** Canopy is one of the largest cannabis manufacturers in Canada with an estimated 25% share of medical. Constellation brands owns a 36% stake in the company with warrants that could take ownership to >50%.

We believe Canopy is ready to launch a range of edible and drinkable products once the Canadian market legalises edibles in 2H19. The company has indicated these products will likely be launched under the Tweed brand. In interviews the Canopy CEO has referred to Tweed & Tonic which would imply that the company, similar to Tinley is targeting the spirits category rather than beer.

**HEXO Corp (covered by Jefferies).** Hexo Corp one of the leading Canadian cannabis companies with a listing on the NYSE. The company has two divisions, Hydropothecary for medical use products and HEXO for adult-use products. HEXO announced a joint venture with Molson Coors in August 2018 focusing on cannabis infused beverages, planning to launch a full range of products in Canada in October 2019. Molson Coors’ CEO Mark Hunter has stated the company believes beverages could take 20-30% of the total US cannabis industry creating a $20bn category.

**Green Organic Dutchman (Covered by Jefferies).** The company has launched a dedicated global beverage division to build an industry leading range of branded products and a range of organic ingredients for global beverage brands. TGOD is said to allocate just over 20% of its production to edibles and beverages. The company is building a 40k square foot research and development center. The company has also acquired HemPoland, leading European CBD oil producer with distribution to 700 POS in 13 markets.

**CannTrust (covered by Jefferies).** In September 2018 CannTrust and Breakthru Beverage Group (leading premium spirits, wine and beer wholesaler) announced an exclusive partnership where Breakthru will set up a route to market and sales co to distribute CannTrust’s adult use products in Canada. CannTrust has three adult-use brands liiv, Xscape and Synr.g and a range of next generation drinkable products ready for launch 2019. It has the Gold Peak tea and Coffee brand and developed the BrewBudz product, currently with Cannabinniers, for which it has an agreement to take back in case the US legalises recreational use on a federal level.

**OrganiGram (covered by Jefferies).** We believe is currently mainly focused on edibles having announced a partnership with Canada’s Smartest Kitchen to develop a signature line of products.

**Emerald Health Therapeutics (covered by Jefferies).** Emerald Health is developing a range of consumer products targeting a “purposeful” customer. Per the company they
have stated they are not interested in a smokeable product or an infused beer product but rather a "cannabis-infused sports recovery drink".

FLOWR (covered by Jefferies). Together with Ace Hill Beer, FLOWR has launched the premium quality Ace Valley cannabis brand. Its initial products will be pre-rolled joints in two strains (Ace Valley Sativ and Ace Valley CBD) and later as it legalises in Canada a range of infused beers.

Aphria. In an interview November 8 2018 Aphria’s CEO Vic Neufield said the company is looking to make sure the company from an established industry it chooses to partner with will "leverage" the company’s vision. The company also confirmed that it is in dialogue with multiple players in different industries. Aphria uses c10% of its production to an extraction facility for concentrates actively aiming to diversify its portfolio away from flower.

CannaCraft. is a medical cannabis manufacturer based in Sonoma with its core brand families: AbsoluteXtracts (cannabis oil), Care by Design (CBD medicine) and Satori (cannabis chocolates). The AbsoluteXtract brand is grown in Northern California and is the cannabinoid used in Lagunitas Hi-Fi Hops.

Stillwater ingredients is the company’s B2B division producing RIPPLE SC (Soluble Cannabinoids) which is standardised, clean-label, water soluble and shelf-stable hemp-derived cannabinoids as ingredients to manufactured foods. The SC can be mixed into wet or dry food and are suitable for standard commercial food manufacturing processes with no impact to flavour or consistency.

Stillwater brands is the company’s B2C division that owns a range market leading TCH and CBD infused edibles in Colorado. Brands include Ripple Dissolvables (no flavour, no calories), Stillwater Gummy Supplements and Stillwater Teas & Coffees. Having the B2C division gives the company a clear understanding of issues around scale, supply chain and end consumer demand that will face the end consumer of its B2B ingredients customers.

Some products of the ingredient business:

- **Flowable powders**: powdered drink mixes, baking mixes, extruded snacks pet foods and confections.
- **Liquid concentrates (RTD)**: RTD beverages, wet mixes.
- **Liquid concentrates (food)**: gummies, energy gels, energy bars.
- **Film coatings**: dried fruit and vegetables, nuts and teas.

All formats of cannabinoids are water-soluble which the body absorbs faster, Stillwater’s ingredients products have an onset of 15 minutes post consumption with max absorption after 45-60 minutes.
At the end of the value chain - Cannabis infused drinks brand owners
We find that typically, the consumer facing cannabis beverage companies are more FMCG like and tend to purchase cannabis from downstream growers. The cannabis manufacturer owns the technology for infusion and ensure cannabinoids are evenly dispensed through the liquid. Only licensed manufacturers are legally allowed to infuse THC into the liquid. The brand owner sometimes takes a position in the value chain as the brand/recipe owner (similar to KO) with production and manufacturing fully outsourced.

A range of brands available
Tinley Beverages. Based in California, the worlds’ biggest cannabis and beverage market with a large affluent population demanding premium products. Tinley sees beverages capturing a significant share of the cannabis market (refer to TAP CEO 20-30%) and act as a key recruiter of new consumers into the cannabis space (switch from alcohol to cannabis 80% beverages). Beverages is a sociable, generally accepted way of consumption without smell or taste of cannabis.

Key to unlock the infused beverage opportunity will be: 1) Product quality (taste, onset and psychoactive effect) to offer a consistent and predictable experience; 2) Distribution access and recruit customers; and 3) Regulation. Tinley believes their next generation products (launch early 2019) will meet the product quality criteria (40-50% of effect within 10-15 min, max peak in 30 min). Distribution is currently almost 100% off-trade through dispensaries with c50% online (home delivery), the creation of an on-trade channel will be key, also marketing and customer trial/recruitment through events and parties.

Cannabis infused Cocktails Tinley Lime Margarita (5mg per bottle, 60 kcal per serving) and Flying Mule (5mg per bottle) sold at $24 for 4 bottles ($6/bottle). Margarita pilot launch 2Q18 with broader distribution from 3Q18, following some repositioning due to regulation in 4Q the range was extended 1Q19, next generation product launch planned early 2019. Flying Mule launched August 2018. The company has partnered with a tequila producer to create a non-alcoholic tequila that is then infused with cannabis and mixed into ready prepared cocktails.

In January 2019 the company started to produce the Tinley ’27 collection, three non-alcoholic spirit extracts to drink on the rocks or to mix cocktails. Three variants: Coconut Rum Extract, Amaretto Extract and Cinnamon Whiskey Extract all with 80mg THC (8*1.5oz servings) to be sold at c$30 per bottle. The company also sells a CBD hemp-extract tonic called Hemplify.

The products are currently produced by third-party but Tinley is building its own factory with initial line capacity of 10-15m bottles/year (can run over night 2x), will also put in a can line with double capacity. The company is also adding a distribution centre for DSD operations which is critical in beverages with merchandise, owning truck and shelf space.

We believe the company is targeting to be a key brand and co-packaging partner for third-party consumer brands, potentially large beverage players, looking to enter the cannabis segment in the future.

The company has no interest in vertical integration towards cultivation or extraction, also not planning to expand into other types of edibles. The company purchases THC on the open market. Manufacturing and distribution focus offer investors a pure-play on the beverage segment of the cannabis industry.

Currently only present in California we believe next steps would be Nevada and Canada.

Please see important disclosure information on pages 42 - 47 of this report.
Customer research shows some do mix the cannabis infused margarita with real tequila.

**Lagunitas.** The craft brewer Lagunitas owned by Heineken has launched cannabis infused Hi-Fi Hops, an IPA inspired non-alcoholic, zero calorie and zero carb drink. Hi-Fi Hops is available in two versions, one CBD and THC (5mg + 5mg) and one pure THC (10mg) sold at $8 retail price. The onset is stated to be 15 minutes and last for up to 3 hours.

As Lagunitas is an alcohol manufacturer it has to comply with the Alcohol and Tobacco Tax and Trade Bureau (TTB) and have all drink formulas certified, the company clearly states it does not cultivate, manufacture distribute or sell any cannabis products. Lagunitas sells the de-alcoholised hop water to CannaCraft, who takes full ownership and profits from there.

The production and distribution of Hi-Fi Hops is done by CannaCraft, one of California’s biggest cannabis manufacturers. The de-alcoholised beer is infused with cannabis from the brand AbsoluteXtracts, owned by CannaCraft. CannaCraft’s sister company Kind House Distribution is responsible for distributing the products in California.

**Cannabiniers.** Cannabiniers define themselves as a cannabis brand management company providing consumer products. The company cultivates, and sources cannabis plants and holds a process patent for their extraction method.

The company has four beverage brands:

- **Two Roots Brewing Company** non-alcoholic 2.5mg THC infused craft beer sold at $5 per 10.5oz sleek can
- **Just Society Cold Brew** beverages (cold coffees and teas) launched in July 2018 initially in Nevada.

Please see important disclosure information on pages 42 - 47 of this report.
**Beverages**

- **Brewblendz** (cannabis infused tea and coffee)
- **Brewbudz** (cannabis infused tea and coffee in 100% compostable pods).

The company brews Two Roots as traditional craft beer then strips out the alcohol, the de-alcoholised beer is mixed with 2.5mg THC in a water soluble micro-dose that is absorbed by the body within 5-7 minutes and dissipates over 90 minutes. The beer range currently includes Lager, Stout, New West IPA, Blonde Ale, and Wheat; with a “Tribute” style beer that tastes like cannabis in production.

Cannabiniers has protected IP rights to the technology to achieve the quick onset and dissipation. Although dispensaries were initially sceptical about the low dosage of THC – the Two Roots brand successfully targets consumers looking for new, non-alcoholic options in social settings rather than incumbent cannabis consumers.

In October 2018 Cannabiniers announced a strategic brewing agreement (50k bbls) and has since issued LOI's to acquire 3 breweries adding 200k bbls, forecast 2-3 breweries (200-300k by Q19), the co targets 500k bbls at latest by mid 2020. The company targets an aggressive roll-out taking advantage of their first mover advantage ahead of potential federal legalisation and the likely following market entry by the beverage giants.

Cannabiniers has recently appointed Michael Lorelli (previously PepsiCo) to its Board and Victor Jerez joined the company as COO with extensive experience from the spirits industry, most recently at William Grant and Pernod Ricard. In December the company announced the opening of the first Cannabis Speak Easy (bar) in Las Vegas, an in-dispensary craft tasting bar.

Cannabiniers has also launched **Brewbudz**, cannabis infused coffee pods that are compatible with all Keurig coffee machines (patent owned by CannTrust). The Brewbudz contain coffee (regular and decaf), tea or hot chocolate as well as cannabis flowers. Coffee and tea pods contain 10, 25 or 50mg of THC from the Sativa strain (energising) whilst the night-time tea pods contain Indica strains (relaxing or sleeping). The pods are 100% compostable made from recycled coffee beans and retail at c$7 per pod.

**Exhibit 40 - Two Roots Craft Beer range**

**Exhibit 41 - BrewBudz cannabis infused coffee pods**

Source: Cannabiniers

Please see important disclosure information on pages 42 - 47 of this report.
**High Style Brewing Company.** High Style Brewing has launched an alcohol-free, cannabis infused craft beer Pale Haze in California (10mg THC from the sativa strain - energising and euphoric). Each bottle contains 50 calories sold at a recommended retail price $12. Initial onset is stated to be within 15 minutes, but the company recommends consumers to wait 30 minutes to know the full impact, the high lasts for 4-6 hours.

The company is launching a variant with 5mg THC and 5mg CBD in 1Q19. The brand targets consumers with an active, healthy lifestyle that likes to be outside, socialise and enjoy sports and nature. The company uses a water-soluble HC distillate that it buys in the open market, it then adds a proprietary terpen blend to create the characteristic high.

**Ceria Brewing Company.** Ceria introduced Grainwave, 5mg THC infused beer in Colorado in January 2019 brewed by Keith Villa, previous brewmaster of Blue Moon. Grainwave is a Belgian style white ale, medium bodied brewed with with blood orange peel and coriander. It retails for $7.95 per 10 ounce bottle with an onset of 12-15 minutes and duration designed to mimic the experience of a beer (c1 hour). Planned launch of two additional beers in early 2019, an American Lager (2.5mg THC) and an IPA (10mg TCH).

The company indicates they mainly target consumers that are looking for variety and a social, energising experience rather than someone that is looking to get very high.

The beer is brewed by contract brewers, according to Keith Villa's recipe, then de-alcoholised and shipped into the state to Keef Brands, a licensed cannabis manufacturer. The brewer charges Ceria for the de-alcoholised beer who then sells it on together with the brand name to the cannabis manufacturer and distributor (Keef brands). Ceria operates an asset light strategy, aiming at replicating a similar business model as KO.

**Province Brands.** The Canadian adult beverage company has developed a patent-pending process to brew beer from cannabis instead of barley and instead of infusing non-alcoholic beer with THC or CBD. This creates an alcohol free, low calorie and low sugar product with 6.5mg THC. It has a 123k square foot production facility with capacity of 51m bottles per year. The company has already signed several agreements for license production e.g., co-packing agreement with Murphy Hospitality Group for their Canna Island subsidiary as well as agreements with Lost Craft Beer Co and Bell City Brewing Co. Province Brands is also launching 7% ABV Cambridge Bay Imperial Pilsner, brewed from Hemp.

**Tarukino.** US based Tarukino produces six cannabis-infused soft drinks Happy Apple Diet (juice), Twisted Apple (sparkling), Utopia (zero calorie, flavoured sparkling water), Vertus (“Champagne”), Pearl2O Mini (flavourless mixer) and Reeb (cannabis-infused barley drink).

The products based on the company’s proprietary water-soluble Sôrse technology which guarantees no taste or smell, have been approved by the Washington State Liquor Control Board. The CEO of Tarukino highlights the company’s aim to show the cannabis industry there are better ways to consume cannabis than smoking and that edibles does not have to taste or smell of cannabis.
**California Light.** A cannabis infused, sparkling fruit juice that aims to provide consumers a “light, social high” with no hangover or health effects. It retails at c$8-$10 per bottle with 10mg THC from the sativa strain. The founders of the brand focus on offering consumers a light, sociable high – similar to that of alcohol, not getting the consumer very stoned. The flavours of the drinks maintain some hints of cannabis to attract cannabis consumers.

**Exhibit 44 - California Dreamin - Cannabis infused beer**

Source: California Dreamin

**Recess.** A CBD and adaptogen infused sparkling water (hemp extract, American ginseng, L-theanine and Schisandra). Each can contain 10mg of CBD and retails at $4.99 per can in fruity flavours (blackberry chai, peach ginger and pomegranate hibiscus). The drink is said to offer a feeling of balance and clarity.

**Mood33.** Sparkling spiked tonic retailing for $8 per bottle branded as a premium healthy beverage with only 33 calories per bottle. The three “moods” joy, passion and calm contain flavours like green tea, dried lemon peel and rose hibiscus, different levels of THC and CBD and the specific terpenes to achieve the ascribed mood. The founder of Mood33 (Eric Schnell) has previously founded Steaz the first USDA organic-certified sparkling tea brand and Good Catch a vegan seafood company.

**Level+.** Non-sugary functional soft drinks Sold in 16ounce plastic bottle containing 5mg THC or CBD per bottle. Flavours available are Lemon and Ginger (CBD), Grapefruit (THC) and Watermelon (THC). The company also sells two variants of Coava cold brew coffee infused with 5mg of CBD or THC.

**Sir Newtons.** All-natural flavour craft sodas in the flavours with no sugar, zero calories, no caffeine, sold in 12oz cans with 10, 50 or 100mg THC at retail price $4 / $8 / $17. Black Cherry, Kiwi Strawberry, Lemon Lime, and Mandarin Orange.
Exhibit 45 - Recess cannabis infused beverages

Source: Recess

Exhibit 46 - Mood33 cannabis infused drink

Source: Mood33

Please see important disclosure information on pages 42 - 47 of this report.
Regulatory update

For details on the legislative environment, refer to the report published by our cannabis analyst, see below a quick summary of the regulatory status of a number of markets:

**Uruguay – fully legalised.** Uruguay was the first country to legalise cannabis possession and commercial activity in 2013. Since July 2017 it is legal to sell cannabis through local pharmacies to citizens or permanent resident holders only, customers are required to sign up to a national register of cannabis users and are not allowed to buy more than 40 grams per month. The price is set to $1.30 per gram fixed by the National Drug Council of Uruguay.

**Canada full adult-use legalisation.** Cannabis was fully legalised through the Cannabis Act passed on 17th October 2018. Within the country there are varying regulations between different provinces on selling and consumption limitations e.g., in Ontario only government run stores can sell, in Quebec cannabis smoking restrictions are the same as for tobacco whilst in Yukon it is only allowed within private properties. The legal purchase age is 19 everywhere apart from Alberta and Quebec where it is 18.

The scope of current legalisation does not include cannabis edibles (solid and beverage), cannabis extracts or cannabis topicals. These sub-categories are proposed to be legalised from October 2019 (“no later than one year after the legalisation of flower/oil”).

Per BDS data, since the legalisation spending has risen from $569m 2017 to $1.2bn 2018.

**Peru – medical allowed.** Medical cannabis legalised as well as the production, sale an import of cannabis oil. Possession of cannabis (max 8 grams) is allowed if it is intended for personal, immediate consumption.

**Colombia – selling illegal, personal consumption allowed.** In Colombia it is illegal to sell cannabis but allowed to consume (possession up to 22 grams) and grow for personal use only (maximum 20 plants).

**Spain – private member clubs.** It is not illegal for citizens to grow or consume cannabis in private. It is illegal to sell cannabis but if becoming a member people can buy from over 800 private member clubs.

**The Netherlands – mixed rules.** In the Netherlands it is illegal but not punishable to sell cannabis and typically accepted by the government if the outlets follow certain rules around advertising, opening times etc. It is only allowed to sell to citizens although the coffee shops in Amsterdam are exempt from this rule. Possession up to 5 grams for personal use is legal.

**Czech – medical on prescription allowed.** Medical use is allowed if prescribed by a doctor (since 2013). Small scale growing (max 5 plants) and possession for personal use (up to 15 grams) is not illegal but considered a police caution.

**South Africa – legal since September 2018.** In South Africa cannabis is classified as legal for private consumption and growing for private use since September 2018.

**Mexico – medical – potential for recreational near?** In Mexico, senator Olga Sanchez Cordero has proposed a bill that would legalise recreational cannabis and create a medical marijuana industry. This would allow each person up to 20 plants for personal consumption as well as regulation and monitoring of production, sales and
consumption. We believe the proposed legalisation in Mexico is a step to try to reduce profitability for illegal cannabis and thereby reduce drug related crime and violence.

Aurora Inc, has signed an exclusive partnership with pharma manufacturer Farmacias Magistrales to supply Mexico with medical cannabis.

**Asia ROW – still widely illegal.** S Korea first Asian country to legalise medical use followed by Thailand. In India cannabis is federally illegal but consumption for medical purposes is allowed in certain states.

In general, in Asia the laws are very strict and punishments hard, e.g., in Japan smoking a joint can lead to up to five years in prison and hard labour and in Indonesia, Malaysia and the Philippines selling or trafficking cannabis can lead to a death sentence.


New York Gov. Andrew M. Cuomo announced that he would push to legalize recreational marijuana next year, a move that could generate more than $1.7 billion in sales annually and put New York in line with several neighboring states.

In 2018, the proposal to legalise cannabis in North Dakota failed and in Missouri and Utah it was only allowed for medical use.

**Legalised on federal level?**
According to a 2018 survey (Pew research) 62% of the population in America are pro cannabis legalisation compared to 31% in 2000. Jefferies cannabis analyst does not include federal legalisation in his base case. In his upside case he assume federal legalisation 2023.

**Exhibit 47 - 62% of US population pro cannabis legalisation**

![Graph showing cannabis legalisation trends from 1969 to 2018](source: Pew research 2018)

**Drug driving**
All states in the US and Canada have official regulation and limitations regarding driving under the influence of classified substances. Despite this we believe it is less straightforward to convict someone for drug-driving as cannabis stays in the blood for a prolonged period and it is hard to prove if the driver is currently high or if it relates to traces of cannabis from usage several days prior to driving. It is hard to prove the point of consumption even through a blood test, and there is currently no technology allowing for roadside testing similar to a breathalyser for proving drunk-driving. We believe the development of better testing technology and a robust framework similar to that for alcohol, controlling drug driving will be critical for the evolution of the industry.

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In addition to general impairment laws, there are two basic laws that states tend to use when addressing drug-impaired driving:

**Zero Tolerance** laws make it illegal to drive with any measurable amount of specified drugs in the body. These laws are best suited for illegal drugs: if it is illegal to possess or use a drug, then it is reasonable to prohibit driving after the drug has been possessed and used. 16 states have zero tolerance laws in effect for one or more drugs.

**Per Se** laws make it illegal to drive with amounts of specified drugs in the body that exceed set limits. 7 states have per se laws in effect for one or more drugs.

Marijuana Drug-Impaired Driving Laws:

- **18 states** have zero tolerance or non-zero per se laws for marijuana.
- **9 states** have zero tolerance for THC or a metabolite.
- **3 states** have zero tolerance for THC but no restriction on metabolites.
- **7 states** have specific per se limits for THC
- **1 state (Colorado)** has a reasonable inference law for TH

### Production and manufacturing

In Canada each cannabis company must apply for a license to cultivate, license to process and license to sell for each individual facility. In the US, companies also need licenses for cultivation, processing and selling on an individual state by state basis. Today the number of licenses issued is very limited. This implies beverage companies can’t produce or sell cannabis infused products, with THC acquired from a licensed producer, without having a license for manufacturing/selling. To date most beverage companies instead chose to partner with a licensed company for the production and distribution.

### Child resistant packaging

The US has child-resistant packaging, known officially as “special packaging,” thanks to the 1970 Poison Prevention Packaging Act, enacted in response to the high number of children ingesting hazardous household products, from cleaning products to prescription drugs.

The act required child-resistant packaging to be “significantly difficult” for kids under five years to open within a few minutes and “not difficult for normal adults to use properly.” It has to be tested at facilities approved by the federal government.

The Medical Marijuana Code required that products be enclosed in packaging that can’t be quickly opened by children, but that doesn’t present a challenge for seniors and disabled people. California, which legalized recreational marijuana in January of this year, also requires that packaging be tamper-evident—the way bottled water or vitamin bottles might be, with a seal that must be unbroken.

### Restriction on selling

To date, in Canada and US states medical and recreational cannabis is only allowed to be sold through dispensaries (Canada medical through pharmacies and recreational through state owned dispensaries, US most dispensaries private with license).

Longer-term, the sale of cannabis products is relatively similar to that of alcohol in terms of regulation and consumption occasions which would make spirits retailers well suited to also sell cannabis. Alcoholic beverages today is sold c50% on-trade and 50% off-
trade - for cannabis we have just started to see a few cannabis lounges connected with dispensaries.

**Lack of regulation could prove a risk to industry growth**

We believe a significant risk for the growing recreational cannabis industry in N America is the lack of a "legal regulatory framework". If the opening up of the cannabis industry shows signs of leading to abuse, accidents or violence there is a risk the regulators will clamp down and revert / hold-off legalisation.

The alcohol industry is highly disciplined when it comes to under-age and responsible drinking, and has generally self-regulated to stay ahead of regulators — eg advertising restrictions, formulation approvals, restrictions on selling times and outlets etc. We believe the cannabis industry could learn from beverage alcohol in terms of self regulation and compliance. The Wine & Spirits Wholesalers of America (WSWA) in July 2018 published an official policy calling for the federal government to respect the states right to legalise adult-use if they adopt a regulatory framework like that of alcohol.
Company Valuation/Risks

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Recommendation Published February 25, 2019, 05:13 ET.
Recommendation Distributed February 25, 2019, 05:18 ET.

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- Constellation Brands, Inc. (STZ: $169.06, BUY)
- Davide Campari (CPR IM: €8.28, HOLD)
- Diageo (DGE LN: p3,019.50, BUY)
- Green Organic Dutchman Holdings Ltd. (TGOD CN: C$3.70, BUY)
- Heineken (HEIA NA: €88.02, BUY)
- Molson Coors Brewing Company (TAP: $61.93, UNDERPERFORM)
- Pernod Ricard (RI FP: €151.90, HOLD)
- The Coca-Cola Company (KO: $45.28, HOLD)
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